RF-SHIELDED AMBIENT PHOTOMULTIPLIER HOUSINGS

The PR-1400RF and PR-1401RF housings are specifically designed to incorporate all of the important features for optimum PM tube performance. The PR-1400RF accommodates 2 inch and 1-1/2 inch diameter PM tubes while the PR-1401RF specifically houses 1-1/8 inch diameter and smaller PM tubes. Both housings offer common basic features.

The PR-1406RF provides an unpotted removable dynode chain for users wishing to experiment with dynode chain design. In all other respects, the PR-1406RF is identical to the PR-1400RF.

The PR-1407RF includes a spring loaded socket assembly which is especially useful when working with vacuum systems, light pipes, scintillating crystals, or similar light sources which must be in intimate contact with the tube face to insure optimum performance.

The ADH-1400 is a variant of the PR-1400RF which includes a photon counting amplifier discriminator. In all other respects, the ADH-1400 is identical to the PR-1400RF.

The PR-1402RF and PR-1405RF accommodate 1-1/8 inch diameter side window PM tubes. The PR-1402RF, the basis for the PR-1405RF, is ideally suited for those applications not requiring a shutter. In the PR-1405RF the low profile manual light shutter completes the package by insuring a totally light tight “O” ring sealed unit ready for immediate operation.

The PR-1409RF accommodates 2 inch and 1-1/2 inch diameter PM tubes and provides axial adjustment of the photocathode position while the PM tube is operating.

The PR-1422RF accommodates 1-1/8 inch diameter side window PM tubes. This housing is intended to be used as OEM equipment and is compatible with many existing applications.

The PR-1202RF accommodates 5 inch diameter PM tubes. In all other respects, the PR-1202RF is identical to the PR-1400RF.

The PR-1206RF accommodates 3 inch diameter PM tubes. In all other respects, the PR-1206RF is identical to the PR-1400RF.

The PR-1120RF is specifically designed for vacuum applications using 1-1/8 inch diameter and smaller end window PM tubes. A spring-loaded socket assembly holds the tube face in position against an internal “O” ring in the front flange, while an external “O” ring provides the seal to the vacuum system. In other respects, the PR-1120RF is identical to the PR-1401RF.

The following symbols may be present on equipment and/or instruction manuals:

Symbol	**Publication**	**Description**
⚠	ISO 3864, No. B.3.1	Caution-Refer to Accompanying Documents
⚠	ISO 3864, No. B.3.6	Caution-Risk of Electric Shock
⏚	ISO 417, No. 5019	Protective Conductor Terminal
1	IEC 417, No. 5007	On (Supply)
0	IEC 417, No. 5008	Off (Supply)
	IEC 417, No. 5016	Fuse

54303/9903

SPECIFICATIONS

PR-1400-01-06-07-09RF **ADH-1400, PR-1120RF**	**PR-1202-06RF**	**PR-1402-05RF** **PR-1422RF**
3000 MAXIMUM DC VOLTS	3000 MAXIMUM DC VOLTS	2000 MAXIMUM DC VOLTS
A HIGH PERMEABILITY MAGNETIC SHIELD, 0.040 THICK, EXTENDING 1/2 INCH IN FRONT OF PM TUBE CATHODE IS AN INTEGRAL PART OF THE HOUSING (THE PR-1120RF MAGNETIC SHIELD DOES NOT EXTEND BEYOND THE PMT TUBE CATHODE DUE TO THE VACUUM SEAL)		REQUIRES SH OPTION
ELECTROSTATIC SHIELD (WHEN SUPPLIED) OPERATES AT CATHODE POTENTIAL ON MOST TUBES. SEE ENCLOSED DRAWING A55822-1740	NOT AVAILABLE	NOT AVAILABLE
AN OPAQUE INSULATING RING NEAR THE FRONT END OF THE MAIN CYLINDER CENTERS THE TUBE WITHIN THE HOUSING	NOT AVAILABLE	NOT AVAILABLE
ALL TYPES ACCEPT PR-305 LIGHT SHUTTER (PR-1401RF REQUIRES SPECIAL ADAPTER)	PR-1206RF ACCEPTS PR-315 LIGHT SHUTTER	PR-1405RF INCLUDES BUILT-IN LIGHT SHUTTER

THE ANODE CONNECTOR IS TYPE BNC AND THE CATHODE CONNECTOR IS MHV, UNLESS OTHERWISE REQUESTED.

⚠ DETECTOR INSTALLATION

⚠WARNING

TO AVOID POSSIBLE SHOCK HAZARDS, TURN OFF ALL POWER (HIGH VOLTAGE, LINE VOLTAGE, ETC.) BEFORE ANY INSTALLATION, REMOVAL OR ADJUSTMENT OF THE SYSTEM OR ANY COMPONENTS.
EXTREME CAUTION MUST BE EXERCISED IN APPLYING HIGH VOLTAGE TO THE DETECTOR. DO NOT UNDER ANY CIRCUMSTANCES EXCEED THE DETECTOR MANUFACTURER'S MAXIMUM RATED VOLTAGE AS INDICATED BY THE SERIALIZED TEST TICKET PROVIDED WITH THE DETECTOR.

PR-1400RF PR-1401RF PR-1406RF PR-1407RF ADH-1400 PR-1120RF

1. Unscrew socket section of housing from main cylinder by rotating counterclockwise.
2. Insert PMT in socket and install electrostatic shield (when supplied) per drawing A55822-1740.
3. Replace tube socket assembly into main cylinder and rotate to a finger-tight condition.
4. The front flange may be unscrewed from the main cylinder if desired without degrading housing performance (except on PR-1120RF where it is necessary for vacuum work).

PR-1402RF PR-1405RF

1. Remove the safety latch screw that prevents accidental opening of the two cover latches.
2. Snap both latches open and lift cover from base plate.
3. Install tube in socket and, if a magnetic shield has been ordered, slip the shield down over the tube. Orient the slot with the PMT cathode, and verify alignment with the entrance hole.
4. Replace the cover and secure the latches. Check to be sure the cover has seated tightly against the base plate "O" ring.
5. If your unit is a PR-1405RF, do not separate the shutter assembly from the housing base plate, as the light-tight integrity will be lost.

PR-1409RF

1. Unscrew socket section of housing from main cylinder by rotating counterclockwise.
2. Insert PMT in socket and install electrostatic shield (when supplied) per drawing A55822-1740.
3. Replace tube socket assembly into main cylinder and rotate to a finger-tight condition.
4. The front flange may be unscrewed from the main cylinder if desired without degrading housing performance.
5. Axial adjustment

   A. Remove the large knurled screw at the rear of the socket assembly. This exposes the detector axial adjustment.

B. Using the number 10 hex nut driver supplied with the socket assembly, move the detector back and forth along its axis to optimize cathode location. The mechanism is spring-loaded and light-tight, allowing adjustment while the detector is in operation. Some assemblies may require a slight push on the hex nut to assist the spring system when moving the tube forward. The assembly is factory preset to the nominal cathode location.

⚠ **CAUTION**

DO NOT OVERTIGHTEN NUT, AS THIS WILL BREAK THE NYLON SCREW AND DESTROY THE ADJUSTING MECHANISM, AND POSSIBLY DAMAGE THE TUBE.

C. When the adjustment is complete, secure the large screw at the rear of the socket assembly to insure RF shielding integrity.

PR-1422RF

1. Remove (4) socket head screws from the connector plate and remove the socket assembly.
2. Install PM, making sure to line up socket key with tube base.
3. Slide magnetic shield (when supplied) over PMT. The opening in the magnetic shield must be over the photocathode of the PMT.
4. Verify that the bottom “O” ring is seated in it's grove. Reinsert the socket and PM (with magnetic shield) into housing body.
5. Rotate connector plate until connector labels are in line with the labels on the housing body. The photocathode should now show in the light aperture. Check to see that the bottom “O” ring is not pinched between the connector plate and the housing body.
6. Tighten (4) socket head cap screws into the connector plate.

PR- 1202RF PR- 1206RF

1. Screw socket section of housing into main housing cylinder rear plate.
2. Attach some type of sticky-back tape such as a cloth-base adhesive tape to 2 or 3 points around the side of the tube envelope at the cathode end. The tape strips should be brought out at least 4 inches in front of the tube and folded back on themselves to form 2 inch tabs to assist in holding the tube during insertion or removal.
3. With the PMT held facing down, lower the housing and socket down and rotate until the key of the PMT base is oriented with the socket. Press the PMT firmly until seated into the socket.
4. Center the tube in the magnetic shield and remove the tape

⚠ SOCKET SCHEMATIC INFORMATION

The following pages show some of the more commonly used photomultiplier tube socket assembly schematic references. If a different schematic applies, it is substituted in this manual as a separate sheet. To determine which reference applies, refer to the socket assembly label. The listing is: Device type/Schematic Number/Wiring Number. The schematic reference is either the entire schematic number (e.g. 23456.0010), or the schematic number preceded by SCH820.